**Crops**

This track provides an opportunity to combine and synthesize relevant Building Block information and to think more broadly about strategies to mitigate GHGs that may not be addressed in the Building Blocks documents. Synergies among mitigation strategies will be discussed, but tradeoffs will also be considered. For example, using legume cover crops to help meet crop N needs reduces GHG emissions upstream since production of N by biological nitrogen fixation produces substantially fewer GHGs than production and transport of N fertilizers (e.g. Hoffman et al. 2016). Also, using organic nutrient sources involves less upstream emission and contributes to soil health, since they add organic matter and contribute to slowly mineralized organic soil N pools, unlike synthetic N fertilizers. Conversely, meeting some soil health objectives could elevate $N_2O$ emissions targeted in the N Stewardship Building Block. For example, no-till typically increases soil C sequestration but may also increase soil $N_2O$ fluxes. There are also issues not addressed in the Building Blocks. For example, reducing the number of high N-demanding crops in a crop rotation can reduce soil $N_2O$ emissions substantially (Cavigelli and Parkin, 2012).

Thus, there is a need to integrate the impacts of cropping systems on GHG emissions. One approach to doing this is by calculating the global warming potential (GWP) of cropping systems. GWP measures the net effect of cropping systems by summing all GHG sources for a cropping system on the basis of $CO_2$ equivalents. The four primary drivers of GWP in cropping systems are soil C sequestration, energy used on-farm, energy used to produce and transport inputs, and $N_2O$ emissions (Robertson et al., 2000; Cavigelli et al., 2009). Thus, this Track combines aspects of Soil Health, N Stewardship, and Energy Efficiency Building Blocks.

**Core issues for workshop:**

- How can we best target the acres in the NE where agronomic management can minimize global warming potential of cropping systems? What management practices should be promoted in the NE to minimize GWP via optimization of C sequestration (tillage, organic nutrient sources, crop rotation), $N_2O$, emissions and energy use?
    - Tradeoffs between soil C sequestration and $N_2O$ emissions.
    - Soil C sequestration has limited capacity; $N_2O$ mitigation is not capped.
- What is the potential in the northeast to better distribute animal manure resources?
- Can human dietary preferences reduce soil $N_2O$ emissions by reducing the need for N inputs?